

COMMENTS ON DEVELOPMENT OF GUIDANCE ON UPDATING OUTPUT ALLOWANCE SYSTEM

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What are sources of information that States need in order to determine and update allocations on a periodic basis?

Generally speaking, States will need two elements: first, the total emission allocation to the State and affected sector (numerator) and the megawatt-hour output over which this is to be spread (denominator). In most cases, data exist to support the sale and purchase of the megawatt-hour output of affected sources, and should serve as an adequate basis for allocation.

Electrical Generation

Where do plants measure electricity?

Generation is measured at each generator (gross generation per unit) and also at the plant busbar (electricity entering the grid from the entire station – net generation per plant). In addition, energy consumption by various plant auxiliaries (scrubbers, for example) may be monitored.

What supporting records are needed for MWH (generation)?

Generally speaking, watt-meters of the solid state variety are highly accurate. As competition evolves in electricity markets, there will be a natural tendency to insure that accurate measurement of unit output – whether electricity or steam – occurs. Sellers will want to make sure that they are compensated for all products sold; likewise, buyers will only want to pay for product delivered.

What are the advantages and disadvantages of measuring net generation?

There are the following advantages:

(1) Net generation is already measured on a plantwide basis. In most cases, net generation is a measure of the “product” of a typical power plant (typical, in this case, referring to a plant whose sole purpose is selling electricity at wholesale or retail).

There are the following disadvantages:

Not all uses of electricity or steam that are internal to a plant are necessarily wasteful. For example, in new, state-of-the-art coal plants, power consumption for pollution-control equipment represents a significant fraction of total internal usage. An allocation

system based upon net generation will penalize both very clean plants as well as inefficient plants.

For sources of generation that sell a only portion of output at wholesale or retail and that use a substantial portion internally for production (paper mills, for example) an emission allocation based upon net output will result in an under-allocation relative to actual useful output.

Less efficient sources have an opportunity to make significant improvements to operations not available to more efficient sources. This could lead to unfair market advantage since cleaner sources have imposed inefficiencies by the additional emission controls required.

What are the advantages and disadvantages of measuring gross generation?

There are the following advantages:

The principle advantage of measuring gross MWe is the simplicity of measuring the output at the generator. This is a comparable measurement that every electric generator currently provides.

Gross generation also provides information on the efficiency of the generator and allows for calculation of heat rate without discounting for energy usage associated with emission control equipment.

Gross generation also allows for allocation of allowances on an individual unit basis. This may be particularly important if individual units come under different ownership as the industry restructures. The Electronic Data Reporting (EDR) requirements are also on a unit basis and modification of this system would be burdensome to all parties.

Gross generation also follows the approach EPA used in the NO_x NSPS rule published earlier in 1998.

There are the following disadvantages:

None.

Should power output be measured as gross generation at the generator or net generation after power plant requirements have been consumed?

See above.

Does gross generation fail to account for a plant's power requirements whose efficiency could be improved?

Gross generation includes all power generated, including that used internally and that sold to the grid. All plants – whether highly efficient or comparatively inefficient – use some fraction of the power generated to run various plant auxiliaries. As pointed out previously, some of this power is used to operate pollution-control devices. Allocating

pollution credits on the basis of net output creates an incentive to improve plant efficiency. In some cases, however, this is not possible or cost-effective.

With the industry restructuring, market incentives will drive efficiency improvements.

Can net generation be measured at the point of sale?

Yes. However, there may be points of sale and points of re-sale. For example, a generator sells power to a marketer (where the point of sale is the step-down transformer or the busbar). The marketer then sells the power to a local distribution company (where the point of sale is a predefined substation). The local distribution company finally sells the power to a retail customer (where the point of sale is the customer meter).

Can all electric generating plants measure net generation at the same general location and with the same method?

Generally yes, although some variation will exist between plants or systems.

How can EPA allocate based on generation measured at the plant level or the generator or turbine level, when EPA's allowance tracking system tracks at the unit (boiler or turbine) level and EPA's emission tracking system tracks emissions and heat input at the unit and stack levels?

Allocation and emission measurement need not be directly tied. Emissions will continue to be monitored in the present fashion; allocation on an output basis requires reconciliation in the same way that the allowance tracking system must be reconciled with the monitoring system. Whether the existing allowance tracking system must be adapted to output-based allocation or a new system devised is an open question.

Steam (Thermal) Output

How is steam output measured? With what equipment? In what units?

Steam output is measured with pressure taps on steam pipes exiting boilers. ASTM provides specifications for testing and measurement. Steam is typically measured in thousands of pounds per hour, at a given pressure and temperature.

Where is steam output measured?

Steam output is measured at a number of places. Again, it is important to point out that where steam is sold as a product, both the buyer and seller have an incentive to insure that accurate measurement occurs.

What supporting records are needed for mmBtu steam output?

Records of transactions (steam sales) between sellers and buyers should be sufficient.

Mechanical Output

We believe mechanical output is an insignificant factor for facilities meeting the size criteria for this rule.

Equipment sources use to measure output

Is standard equipment available to measure power output?

Yes. Although it is necessary that equipment meet appropriate standards, not that it be identical.

Does the measurement equipment vary based upon the source of energy?

No.

Does the measurement equipment vary based upon the unit type or the generator/turbine type?

No.

What standard methods exist for ensuring the accuracy of output monitoring equipment?

For instrument transformers: IEEE Standard No. 57.13; ANSI Standard No. C93.1
For meters: ANSI Standard No. 12.10

Do sources typically use those accuracy standards?

Yes.

What is the typical error found in output measurements? Is the error different for steam and for electricity?

“Relay accuracy class” equipment measures output with an accuracy of about 2 percent. “Revenue metering accuracy class” measures output with an accuracy of 1 percent or better. As competition evolves in the industry, this technology is becoming prevalent.

Comparing and converting heat input steam output and electrical output.

Should steam output be converted to electrical output. If so, which method should be used to convert steam energy to electrical power equivalent? If steam energy were not converted, how could emissions limitations be treated for cogenerators?

There are advantages and disadvantages to converting steam to electrical output. The primary advantage is that allocations to cogenerators can be unified to a single output. The primary disadvantage is that some judgement must be made about the efficiency of conversion of steam to electrical energy. The method used in the NSPS is adequate. If a conversion is not used, the steam portion of a cogenerator's allocation could come from the industrial allocation to a particular state. Thus a cogenerator would receive one allocation based upon electricity sales and another based upon steam sales.

What assumptions should be made about the efficiency of conversion from steam output to electrical output?

In the NO_x NSPS, a unified assumption was made. This is the simplest approach. The efficiency of each plant is known, and this could provide a more accurate means of converting steam to electricity. This would be more time-consuming and require greater oversight, however. More credit should be given for direct, local steam usage since it is more efficient than the conversion of thermal energy.

If output data were not available directly, what would be appropriate assumptions to make about the efficiency of conversion from heat input to output?

We are not aware of cases in which direct output is not available. However, if the steam is sold, there must be some agreed-upon formula for measuring the sale. These methods can form the basis for an assumption.

How to States receive output data for setting future allocations?

If allocations were to be based upon electrical generation only, can a State use EIA form 759 for whichever ozone seasons a state selects?

Yes. However, as competitive markets evolve other sources of data will undoubtedly emerge as well.

If allocations were to be based upon steam, mechanical and electrical generation, how will a state and/or EPA obtain steam or mechanical data directly from sources.

As stated previously, transaction data can serve this purpose. However, in many cases such data will be competitively sensitive, and the regulating agency will need to have appropriate safeguards to protect the information.

If a State decides to regulate process sources under its SIP, how will the State determine whether it is easier to find out measure input or output data?

This will be specific to the process source. However, for some industries, input information is likely to be less competitively sensitive than output data.